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PROCEEDINGS  
OF THE  
AMERICAN  
IRON & STEEL ASSOCIATION,  
AND OF THE  
CONVENTION OF  
IRON AND STEEL MAKERS,

HELD IN PHILADELPHIA,

*February 4th and 5th, 1874.*

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PROCEEDINGS  
OF THE  
AMERICAN IRON AND STEEL ASSOCIATION,

February 4th, 1874.

The Association met at eleven o'clock on Wednesday morning, February 4th, at its rooms, No. 265 South Fourth Street, Philadelphia, the President, Sam'l J. Reeves, Esq., in the chair. The Secretary, Mr. James M. Swank, read the minutes of the last meeting, which were approved. A few remarks were made by the President in relation to the objects of the meeting, having special reference to the desired union of the iron associations of the country, after which the report of the Secretary was submitted to the consideration of the members present, among whom were Messrs. James I. Bennett, of Graff, Bennett & Co., Pittsburgh, Pa.; Thomas S. Blair, of Shoenberger, Blair & Co., Pittsburgh, Pa.; Robert G. Bushnell, of Park, Brother & Co., Pittsburgh; Percival Roberts, of A. & P. Roberts & Co., Phila.; W. E. C. Coxe, representing the Philadelphia and Reading Rolling Mill, Reading, Pa.; W. S. Mead, of Knoxville Iron Co., Knoxville, Tenn.; C. E. Coffin, of Muirkirk Iron Co., Muirkirk, Md.; Chester Griswold, of John A. Griswold & Co., Troy, N. Y.; John Rogers, of J. & J. Rogers Iron Co., Blackbrook, N. Y.; Wm. G. Neilson, and H. G. Townsend, of Logan Iron and Steel Co., Lewistown, Pa.; G. B. Stebbins, of Wyandotte Rolling Mill Co., Detroit, Michigan; Z. S. Durfee, of Pneumatic Steel Association, New York; W. H. Morris, of Morris, Wheeler & Co., Phila.; E. Y. Townsend, D. J. Morrell and Cyrus Elder, of Cambria Iron Co., Johnstown, Pa.; S. M. Felton and Chas. S. Hinchman, Pennsylvania Steel Co., Phila.; Alfred Hunt and Joseph Wharton, of Bethlehem Iron Co., Bethlehem, Pa.; Wm. Jones, of Alliance Rolling Mill Co., Alliance, Ohio; J. B. Moorhead, of J. B. Moorhead

& Co., Conshohocken, Pa.; T. F. Miner, Jagger Iron Co., Albany, N. Y.; G. W. Barr, of Miller, Barr & Parkin, Pittsburgh, Pa.; S. A. Fuller, of Cleveland Iron Co., Cleveland, Ohio; Orin C. Frost, of Northern New York Iron and Mining Co., Watertown, N. Y.; Frederick J. Slade, New Jersey Steel and Iron Co., Trenton, N. J.; and Samuel J. Reeves, of Phoenix Iron Co., Phoenixville, Pa.

On motion of Mr. Wharton, the President appointed a committee, consisting of Messrs. Morrell, Moorhead, Roberts, Coxe, Stebbir Elder and Rogers, to whom resolutions to be referred for consideration. To the committee Messrs. Wharton and Reeves were added by the desire of the gentlemen present. A memorial to Congress, and several resolutions concerning the proposed union of iron associations and relating to national finances, were referred to the committee, who were authorized to meet like committees from the other iron associations and to unite in a report to be submitted to the general meeting to be held at the Continental Hotel on the 5th inst.

A piece of finely polished cold-twisted steel rail, presented by the Joliet Iron and Steel Co., was submitted to the inspection of the members, after which Mr. Thomas S. Blair exhibited some excellent specimens of cast steel converted by his new direct process for the manufacture of homogeneous iron and steel, which he explained. Samples of rich iron ore and coal from Alabama were presented by Mr. G. B. Stebbins. The President urged the members to attend the union meeting at the Continental Hotel on the 5th inst., after which the Association adjourned.

1-2246

## SPECIAL REPORT OF THE SECRETARY.

*Mr. President and Gentlemen:*

Since the annual meeting of the Association, on the 20th of November last, the office has been removed to more commodious and tasteful apartments at No. 265 South Fourth Street, Philadelphia. This change was resolved upon in consequence of the increased general business of the Association, and especially in view of the necessity which existed for providing accommodations for the scientific commission which had been called to assist us in the work of collecting, classifying, and analyzing iron ores, fuels, etc., for the approaching International Exhibition. Public announcement has been made of the appointment of this commission, and the producers and consumers of the minerals alluded to have been requested to contribute to the fund proposed to be created for the payment of its necessary expenses, and to meet such other pecuniary liabilities as the Association may incur in discharging the trust confided to it. The services of the commission are to be rendered gratuitously. It is expected that it will meet for organization during the present month.

## THE IRON AND STEEL INSTITUTE OF GREAT BRITAIN.

From unofficial information received, it is now rendered probable that the members of the Iron and Steel Institute of Great Britain will postpone their contemplated visit to this country until the year 1876, when the Centennial Exhibition will be held, which will afford the members a better opportunity to compare the iron manufactures of the United States with those of their own country.

## IRON AND STEEL ASSOCIATIONS.

At the mass convention of iron and steel manufacturers, which is to be held on the day following the present meeting of this Association, it is probable that the subject of forming a more perfect union of all the iron and steel organizations of the country will be introduced. In view of this probability, it is proper to call attention to the fact that, on the 7th of December, 1872, a formal proposition to form a federative union was made by this Association; that a conference of delegates representing three of the iron associa-

tions, our own included, was held on the 9th of January, 1873, to consider this proposition; that, in compliance with the instructions of this conference, a constitution for the government of the proposed union was subsequently prepared and submitted to all of the delegates and to others; and that, up to the present time, no communication has been received by this Association intimating that any action whatever has been taken upon the proposed constitution by any of the other organizations. The reasons for concerted and harmonious action are just as cogent now as ever, and if any of the other organizations should submit a plan of union, this Association is prepared to give it prompt and careful consideration.

Presuming that more united action between the different branches of the iron trade of the country is possible and desirable, we venture the suggestion that the duties of this Association and of similar associations should be carefully defined by some committee which shall be jointly constituted. Application to manufacturers for the statistics of their business, to be published for the benefit of the iron trade and for the information of the country, should emanate from only *one* association, and requests for these statistics from all other sources should be refused and condemned. Much annoyance to manufacturers has been caused by the frequency with which they have been asked to reveal the details of their business to various agencies, and much confusion and uncertainty have resulted in consequence of the numerous and conflicting statements that have been prepared and published—wholly or in part—from information thus obtained. The general interests of the iron trade should be intrusted to only one association, for obvious reasons. The association which cares for the general interests of the trade and collects its statistics should have nothing to do with the adjustment of prices of product, wages of labor, and other matters of interest only to special branches of the iron industry. These subjects should be committed to strictly *trade* organizations. There can certainly be no objection to the creation, if need be, of as

many associations of this character as there are branches of the iron trade or districts of iron production. Individual members of these associations could be members of the general body, and it should be the policy of such a body, having care of all the iron interests, to divide the management of its affairs among the different branches of the trade. If it should be deemed necessary for the association representing general interests to publish a periodical, provision should be made for the insertion in its columns of papers of interest relating to every branch of the trade.

#### IRON AND STEEL METALLURGY.

In this connection we are induced to repeat the suggestion heretofore made that the iron trade of this country greatly needs an organization which can accomplish a work similar to that of the Iron and Steel Institute of Great Britain. That body was organized a few years ago "to afford a means of communication between members of the iron and steel trades upon matters bearing upon the respective manufactures, excluding all questions connected with trade regulations;" and it was expressly stipulated that it should "arrange periodical meetings for the purpose of discussing practical and scientific subjects bearing upon the manufacture and working of iron and steel." This scientific purpose has from the first constituted the leading and most valuable feature of the Institute, and it is this feature which no iron association of this country has ever fully possessed. This fact is not creditable to the enterprise, the intelligence, and the *esprit de corps* of American manufacturers of iron and steel; although the truth is that no class of manufacturers anywhere has exhibited more fertility than they in the adaptation of means to ends, more genius in the invention of new processes, more skill in their application, or more generosity in sharing with each other the knowledge they possessed. But, owing to the vast extent of territory over which the iron industry of this country is scattered, and the wide areas which separate iron manufacturers, it must happen that, without an organization specially devoted to

collecting and preserving the fruits of study and investigation of technical and scientific questions, much of the good that might be done by an interchange of ideas and comparison of experience must necessarily be lost. If it has been found profitable for the leading ironmasters of England to meet together frequently for the discussion of scientific questions, surely the inducements for American ironmasters to do the same can not be of trifling significance. We urge, therefore, upon the attention of the members of this Association the propriety of considering whether it would not be wise to give encouragement to the organization of a scientific department of the Association which could give special and undivided attention to the cause of American iron metallurgy. Years ago, in the adoption of the organic law of the Association, this work was declared to be necessary. It was stated to be one of its objects "to provide for the mutual interchange of information and experience, both scientific and practical." This declaration stands unrepealed to-day. But it has never brought forth ripe fruit. The Association has had and still has too many other important interests to care for, and it has not encouraged a scientific membership. May it not now properly lead the way to the realization of its own aspiration, while leaving to others the performance of the work?

#### CONGRESS AND THE FINANCIAL SITUATION.

Since the annual meeting of the Association in November last, the first session of the Forty-third Congress has convened, and many propositions relative to the financial situation of the country have been laid before it. While it may be assumed that Congress will wisely legislate upon a question of such momentous interest to every branch of American industry, it is plainly the privilege of organizations which represent important industries to make public declaration of their views and wishes concerning it, to the end that legislators may receive all needed light upon a problem of great perplexity and difficulty. That this Association should propose to Congress a complete solution of this problem is not, we presume, contemplated;

but that it should avail itself of the privilege to state the probable effects upon the iron and steel industries of any proposed measures of relief is a duty which it can not and dare not disregard. Especially can it not afford to ignore this duty when the fact is considered that the enemies of American industry are active and united in pressing upon the attention of Congress a financial policy which would narrow the opportunities and lower the wages of American labor, and make what capital we have so timid of investment in all progressive enterprises that the material resources of the country would experience no further development, and existing schemes of great pith and moment would be abandoned. The policy which aims to secure a further contraction of the currency, or to continue the existing contraction, may be honestly believed in by some true friends of American industry, but it is a most significant fact that the supporters of this policy mainly come from the ranks of the importers and non-producers of the country and their agents. We speak plainly when we say that there is probably not in the country one importer of foreign merchandise, or one clamorous petitioner for lower duties, who is not also in hearty accord with the policy of contracting the currency. The foreign manufacturer could secure no greater advantage over his American rival than would be afforded him by the adoption of a policy which would check all American enterprise by withholding the water to move its wheels and the fuel to feed its fires.

It has been conclusively shown from official figures, by one of the most eminent statisticians of the country, that from the first of July, 1863, to the first of July, 1873, five years, the withdrawal from actual circulation of the paper currency issues of the National Treasury amounted to three hundred millions of dollars. During this time the currency requirements of the country greatly increased. Is it any wonder that we have had a great panic, or that the blasting effects of that panic are still visible wherever there is a rolling-mill, a blast furnace, a woolen factory, or other monument of the genius of a great people? The fact is not overlooked that

many persons assert that this panic was caused by over-speculation—by pushing the development of the country's resources beyond the demands of the time. But those who assert this forget that the enterprise which builds railroads, opens mines, and establishes manufactories is the enterprise which has made us a great and powerful nation, given steady employment at good wages to millions of our countrymen who possessed no capital but their strong arms, and encouraged the emigration from other lands of a sturdy population to fill up our waste places. A wise policy is not to be condemned because the foolish or the dishonest may pervert it, nor is the enterprise which marks the progress of a nation to be discouraged because a railroad is occasionally built where there is no present business to sustain it.

#### TARIFF LEGISLATION.

Closely related to a proper solution of the financial problem, and in large degree forming a part of it, is the question of tariff legislation. It can not be doubted that the importing interest is not only extremely active in the advocacy of low duties, but that its hopes of accomplishing a reduction have of late been greatly encouraged. The partial disintegration of parties in the West is doubtless one of the causes of this encouragement, but it is certain that a principal cause is the general supineness in matters relating to legislation of the manufacturing interests of the country. Recent and trustworthy information leaves no doubt that the present session of Congress will not be suffered to adjourn without having urged upon it more than one scheme for encouraging the importation of foreign merchandise. It is incumbent upon all the productive industries of the country that they advise Congressmen fully and at once of the evils which would certainly follow a reduction of duties; but it is especially necessary that the manufacturers of iron and steel should do this, for no interest is more virulently opposed and persistently menaced than theirs.

It is probably not known to many manufacturers that there is now pending before the House of Representatives a bill embody-

ing the most mischievous consequences, and which opens up the whole subject of duties on imports. It is a bill for the revision and codification of all the statutes of the United States, including those which relate to the revenues of the Government. This is a measure of the utmost importance, and the greatest care should be exercised in its consideration. Its purpose is to condense into one statute or code all the laws which have been enacted since the foundation of the Government, and are now in force. If the bill were a correct transcript of existing statutes, and if it were not liable to amendment while on its passage, there could perhaps be no reason to fear that injurious consequences would follow its enactment. But it is not a correct transcript, nor has it been suffered to receive the consideration of the House without having added to it many amendments which affect the letter of the original statutes. The errors in compilation are very numerous, and are of a character utterly destructive of all confidence in the bill. That portion which relates to revenue is filled with errors, and if it were possible that it could take the place of our present revenue laws, very great confusion and loss to individuals and the Government might certainly be apprehended. It is hoped that its passage in its present imperfect form is not possible. To guard, however, against any possibility of such a result, it is necessary that Congressmen be fully informed upon those technical clauses which relate to duties on imports. Other bills directly relating to revenue are either pending before Congress or in course of preparation, and at least one of these contemplates a serious reduction in the duties on iron and steel.

#### THE TEN PER CENT REDUCTION OF DUTIES.

In calling attention to apprehended changes in the present rates of duty which would be injurious to the manufacturing interests of the country, we desire also to call attention to an important change which has already been effected. The Act of June 6th, 1872, reducing duties ten per cent., was substantially a free-trade victory, although not intended as such by many who voted for it. Its effect has been to reduce the revenue of

the Government about fifteen millions of dollars, while it has probably not reduced the cost to consumers of any imported goods, certainly not of iron and steel, as the high prices of the last two years abundantly attest. The money lost to the Government by this reduction of duties was gained by somebody, and if the consumers did not get it, the foreign manufacturers must have added it to their other profits. It need not be asked whether it is wise to continue a policy so wanting in beneficial results to our own countrymen, and so productive of princely profits to our commercial and manufacturing rivals. The plain duty of Congress is to repeal the law, and thus place the duties where they were prior to its passage. This action would serve the double purpose of increasing the revenues and protecting American workmen against the grave danger of a continued reduction of wages.

Positive and incontrovertible testimony is not wanting that the industries of the country have been injured by the ten per cent. reduction. Upon some lines of home manufactured goods the profits for years have been so small that only a slight reduction of duty on foreign-made competing goods was necessary to give to the foreigner the virtual control of our market. To illustrate: Two and three years ago very few heavy woollen goods were imported at any American port; now the supply is mostly imported, and American mills oppose to it but slight competition. Philadelphia was once largely engaged in the manufacture of these goods; now who makes them?

It was a shrewd device of the common enemy to secure even a slight concession to his demands. American productive industries were prosperous at the time; the National Treasury was not in need of funds to meet current engagements; hence only a mild protest was made against the ten per cent. reduction. Now, when our manufacturers need the protection afforded by that ten per cent., and when the Treasury needs the revenue it has lost by the reduction, the short-sightedness of the act of twenty months ago is made painfully manifest. The enemy was consistent with himself; we were not

true to our own interests. His policy has ever been to chip off the tariff in detail, while ostensibly not disturbing it—here a little and there a little. We warn the friends of home industry in Congress and the members of this Association that the same line of policy will be pursued at Washington this winter with a vigilance that never sleeps.

#### BRITISH COMPETITION.

That British ironmasters expect a still further reduction of duties on their exportations to this country is evident from the tone of leading English journals. The Liverpool *Albion* not long ago declared that the development of the iron industry of the United States was produced "under the fostering and paternal care of a protective tariff, *which must sooner or later either be greatly amended or entirely abolished*, and then English iron will easily win its way with 'a fair field and no favor.'" The Middlesbrough *Iron and Coal Trades Review* of January 14th of the present year contains the declaration that "the time may come when English iron will be *no longer weighted with a heavy protective tariff* in the struggle against American manufacture, and then the issue may not be so doubtful as it seems at present." Another leading English iron journal, the London *Mining Journal*, of December 27th, 1873, is yet more hopeful, for it sees no cause for alarm in the present duties. It says: "It does not appear likely that the shipments of our railway material to our Transatlantic cousins will experience a further contraction. It is not improbable an appeal will be made to Congress to increase the duty now levied on English iron imported into the United States; and, as the Washington Treasury stands in need of additional revenue, it is quite on the cards that the American Legislature may endeavor to raise some of that extra income *at the expense of British industrials*." That many British ironmasters can well afford to pay our present duties rather than lose our market entirely is shown by the statements of extraordinary profits realized by them in 1873. The London *Colliery Guardian* of January 2d, 1874, referring to the British

iron trade of 1873, which had been exceptionally prosperous, stated that "the pig-iron aristocracy of Scotland have been able, during the last two years, to net a profit of at least £2 per ton over their whole production, and the profits of some of the better situated firms have been much greater." In the same article it declared that "the average value of Cleveland pig for 1873 may be put down at 110s. per ton, or fully 25s. per ton more than the average of any preceding year. At this figure, pig-iron makers were, of course, able to make enormous profits. Those who worked their own ironstone and coal could manufacture the crude metal at less than 60s. a ton over the whole year, and as some firms in this category, such as Messrs. Bell Brothers, Bolckow, Vaughan & Co., and the Rosedale and Ferryhill Iron Company, each manufacture from 3000 to 5000 tons of pig per week, their profits must have varied from £6000 to £10,000 weekly."

From the foregoing citations it plainly appears that our British rivals mean to continue the struggle for the possession of our iron markets; that they expect a reduction of duties in their favor; and that, whether duties are reduced or not, they can well afford to reduce their profits and continue shipments. It is not at all probable that the cost of manufacturing iron and steel will be as high in Great Britain in 1874 as in 1873, yet in the latter year, which was our panic year, British ironmasters sent to this country 371,164 tons of iron and steel, valued at \$25,000,000. This was exclusive of the manufactures of iron and steel we imported from Great Britain. Thus was well illustrated the policy of free-trade advocates. While many of our blast furnaces and rolling mills were standing idle, and thousands of our countrymen were unemployed and their families in need of bread, we took \$25,000,000 worth of British iron and steel at prices which American manufacturers would have been glad to accept.

Such figures are most significant. Taken in connection with the declarations and admissions above quoted, the members of this Association, and we hope the members of Congress, will see at a glance that this is no

time to reduce duties on foreign iron and steel, but rather a most fitting time to increase them.

#### UNIFORM CONSTRUCTION OF REVENUE LAWS.

The importance of uniform construction and application at all the ports of the United States of the laws regulating customs duties received the attention of this Association at its last annual meeting. The subject is here referred to, that opportunity may be afforded to present the following table showing large diversions of steel exports to Boston, which may be regarded as *prima facie* evidence of the existence at that port of some advantage in valuation which does not exist elsewhere. The shipments of cast steel from Liverpool to leading ports of the United States have been as follows since the 1st of October last:

| For the week ending— |       | To New York. | To Portland. | To Boston. | To Philadelphia. | To Baltimore. | To Charleston. | To New Orleans. | To Galveston. |
|----------------------|-------|--------------|--------------|------------|------------------|---------------|----------------|-----------------|---------------|
| October 4, 1873,     | Tons. | 6            | 0            | 105        | 0                | 2             | 0              | 0               | 0             |
| " 11, "              | "     | 0            | 0            | 49         | 0                | 0             | 0              | 0               | 11            |
| " 15, "              | "     | 81           | 0            | 53         | 0                | 0             | 63             | 0               | 0             |
| " 25, "              | "     | 0            | 0            | 129        | 0                | 0             | 0              | 40              | 0             |
| November 1, 1873,    | "     | 61           | 0            | 7          | 4                | 0             | 0              | 0               | 0             |
| " 8, "               | "     | 62           | 0            | 107        | 16               | 0             | 0              | 0               | 0             |
| " 15, "              | "     | 3            | 0            | 0          | 4                | 0             | 0              | 0               | 0             |
| " 22, "              | "     | †            | 0            | 13         | 94               | 0             | 0              | 0               | 0             |
| " 29, "              | "     | *            | *            | *          | *                | *             | *              | *               | *             |
| December 6, "        | "     | *            | *            | *          | *                | *             | *              | *               | *             |
| " 13, "              | "     | 46           | 0            | 47         | 0                | 0             | 0              | 3               | 0             |
| " 20, "              | "     | 51           | 0            | 31         | 0                | 0             | 0              | 0               | 0             |
| " 27, "              | "     | *            | *            | *          | *                | *             | *              | *               | *             |
| January 3, 1874,     | "     | 16           | 0            | 30         | 0                | 0             | 0              | 0               | 0             |
| " 10, "              | "     | *            | *            | *          | *                | *             | *              | *               | *             |
| " 17, "              | "     | 1            | 1            | 30         | 0                | 0             | 0              | 0               | 0             |
| Total.....           |       | 327          | 1            | 601        | 118              | 2             | 63             | 43              | 11            |

\* No shipments reported. † 187 tons Bessemer steel shipped, but no cast steel.

We make no imputation upon the integrity or intelligence of the collector or appraisers of the port of Boston, but there must be some cause for this diversion, and a different mode of valuing steel imports from that which prevails at other ports must be this cause. Formerly New York imported fully three-fourths of all the steel sent to us from Liverpool, and Philadelphia and Baltimore took large quantities, but since the 1st of October Boston has received more than one-half of all the steel imported.

We are credibly informed that foreign steel of really best quality, which is sold as such

in our various markets, is often imported as second quality at a valuation which involves payment of a less duty than the rate paid by best cast steel correctly invoiced.

To prove that we do not speak unadvisedly upon this subject, we quote the following statement from an article in the *Boston Commercial Bulletin* of January 31st: "Boston enjoys the advantage of appraisers who interpret the tariff on steel at a saving of ten per cent. in duty against that charged by either New York or Philadelphia custom officials. It seems, too, that Sheffield manufacturers sell steel to English and European buyers at 60 shillings per cwt., and consign similar goods to their American agents at 50 shillings. By this operation the tariff on steel, costing 10 cents per pound, and paying  $3\frac{1}{2}$  cents and 10 per cent., is dodged, and 2 cents per pound is saved in invoiced value, making the duty only 3 cents. This at least is a generous discrimination in favor of the American consumer."

#### THE EFFECTS OF THE PANIC UPON THE AMERICAN IRON TRADE.

Since the opening of the new year the efforts of this office have been largely directed toward the collection of accurate information showing the effects of the panic upon the home iron trade. At the beginning of the panic, in September last, no industry in the country was so injuriously affected as the manufacture of iron and steel. Later in the year other industries partly revived, but no signs of a revival in the iron trade were apparent until near the close of December, when large quantities of pig iron changed hands at very low figures, some of them certainly not representing the cost of manufacture. Many of these sales were entirely speculative. These transactions gave encouragement to the belief in some minds that the effects of the panic upon the trade had been spent, and that business in the future would continue steadily to improve. These anticipations have not been realized. January was a very dull month in every branch of the iron business, and February opens with no brighter promise. At the end of almost five months of panic, the general iron trade of the country is very little nearer to a condition of health and pros-

perity than at the beginning. The reasons for this unfavorable situation will appear at a glance.

The quantity of iron of all kinds—railroad, bar, and pig—which has annually been required by the railroads of the country during the past few years has been more than *one-half* of the total iron production and importation of the country. This quantity has been required for new track, for relaying old track, for locomotives, cars, car-wheels, bridges, etc. The panic almost stopped the construction of new railroads and repairs to existing roads, and it compelled railroad companies to be so economical of their resources that few orders for new locomotives, cars, and bridges have since been given out. Here is the principal cause of the continued dullness in the iron market, and until railroad companies re-enter the market for the supply of all kinds of railway material there can be no general improvement in any branch of the iron business. How soon they will do this does not now appear. Other but subordinate causes of the continued dullness of the iron trade may be found in the interruption caused by the panic to all business operations largely requiring iron, such as the construction of iron buildings, agricultural implements, sewing machines, stoves, ranges and heaters, mill-machinery, etc., and to the enforced economy of the people in dispensing with minor articles of iron manufacture which they could temporarily do without.

Having in general terms stated the effects of the panic upon the iron trade of the country, we now proceed to present detailed information showing the condition of the trade at the beginning of January. This information has been derived directly from correspondence with the manufacturers of pig iron and railroad iron, the two most important branches of the trade. The figures which we shall present concerning these branches will serve as a correct index to the situation of the merchant bar manufacture, the next most important branch.

**Rail Mills.**—Of 57 rail mills in the country, which are prepared to make rails of heavy sections, returns have been received during January from 50. Of the seven not heard

from, one is certainly known to be idle, leaving only six from which no information has been received. Of these six, four are mills of small capacity. From the 50 reporting mills the following information has been received :

|                                                   |        |
|---------------------------------------------------|--------|
| Whole number of rail mills.....                   | 57     |
| Number of mills making returns.....               | 50     |
| Number of mills running December 31, 1873.....    | 17     |
| Number running full time.....                     | 10     |
| Number running half time.....                     | 7      |
| Number standing.....                              | 33     |
| Number proposing to resume in January.....        | 10     |
| Number uncertain about resuming.....              | 23     |
| Number of hands wholly unemployed.....            | 11,490 |
| Number of hands employed half time.....           | 10,150 |
| Number of mills selling rails.....                | 13     |
| Number of mills not selling rails.....            | 37     |
| Net tons of rails on hand and unsold Dec. 31..... | 36,744 |

**Blast Furnaces.**—At the close of 1873 there were 650 blast furnaces in the country which were either making pig iron or were prepared to make it. Returns have been received during the month of January from 385 of these furnaces, or about three-fifths of the whole number, showing the number of stacks in blast, the number out of blast, the number of tons of pig iron on hand and unsold on the 1st of January, and the number of hands then out of employment. These returns are tabulated below:

#### Bituminous Coal and Coke Furnaces.

| STATES.                       | Stacks heard from. | Stacks in blast. | Stacks out of blast. | Stock on hand.<br>Net tons. | Hands unemployed. |
|-------------------------------|--------------------|------------------|----------------------|-----------------------------|-------------------|
| Penna. { Shenango Valley..... | 21                 | 13               | 8                    | 38,143                      | 291               |
| { Miscellaneous.....          | 24                 | 20               | 7                    | 8,491                       | 663               |
| Maryland.....                 | 3                  | 1                | 2                    | 2,366                       | 50                |
| West Virginia.....            | 3                  | 2                | 0                    | 3,675                       | 79                |
| Kentucky.....                 | 3                  | 1                | 1                    | 3,114                       |                   |
| Ohio. { Hanging Rock.....     | 6                  | 4                | 2                    | 4,879                       | 115               |
| { Mahoning Valley.....        | 15                 | 6                | 9                    | 15,729                      | 741               |
| { Miscellaneous.....          | 11                 | 7                | 4                    | 9,953                       | 363               |
| Indiana.....                  | 7                  | 0                | 7                    | 10,378                      | 500               |
| Illinois.....                 | 5                  | 1                | 4                    | 11,710                      | 200               |
| Michigan.....                 | 1                  | 0                | 1                    | none                        | none              |
| Missouri.....                 | 5                  | 1                | 4                    | 8,976                       | 285               |
| Total.....                    | 105                | 56               | 49                   | 117,414                     | 3,287             |

#### Anthracite Coal and Coke Furnaces.

|                |   |   |   |       |     |
|----------------|---|---|---|-------|-----|
| Wisconsin..... | 3 | 1 | 2 | 3,000 | 100 |
| Michigan.....  | 1 | 1 | 0 | 5,000 | 65  |
| Total.....     | 4 | 2 | 2 | 8,000 | 165 |

#### Bituminous Coal and Charcoal Furnaces.

|               |   |   |   |     |     |
|---------------|---|---|---|-----|-----|
| Virginia..... | 3 | 1 | 2 | 600 | 175 |
|---------------|---|---|---|-----|-----|

*Anthracite Blast Furnaces.*

| STATES.            | Stacks heard from.   | Stacks in blast. | Stacks out of blast. | Stock on hand.<br>Net tons. | Hands unemployed. |
|--------------------|----------------------|------------------|----------------------|-----------------------------|-------------------|
| Massachusetts..... | 1                    | 1                | 0                    | 298                         | 45                |
| New Jersey.....    | 11                   | 5                | 6                    | 12,332                      | 60                |
| New York.....      | 24                   | 19               | 5                    | 27,592                      | 336               |
| Penna. {           | 26                   | 15               | 11                   | 14,822                      | 793               |
|                    | Lehigh.....          | 19               | 12                   | 7,275                       | 435               |
|                    | Schuylkill.....      | 16               | 9                    | 7,220                       | 293               |
|                    | Up. Susquehanna..... | 24               | 17                   | 9,398                       | 354               |
| Maryland.....      | 4                    | 4                | 0                    | 3,703                       | 320               |
|                    | Lower ".....         | 1                | 1                    | 700                         | 50                |
| Virginia.....      | 1                    | 1                | 0                    | 700                         | 50                |
| Total.....         | 126                  | 83               | 43                   | 83,340                      | 2,686             |

*Charcoal Furnaces.*

|                     |     |     |    |        |       |
|---------------------|-----|-----|----|--------|-------|
| Maine.....          | 1   | 1   | 0  | 400    | none  |
| Vermont.....        | 2   | 1   | 1  | 500    | 80    |
| Massachusetts.....  | 1   | 0   | 1  | 238    | none  |
| Connecticut.....    | 7   | 6   | 1  | 3,632  | 78    |
| New York.....       | 9   | 7   | 2  | 3,524  | 46    |
| Pennsylvania.....   | 19  | 14  | 5  | 6,332  | 590   |
| Maryland.....       | 8   | 7   | 1  | 4,732  | 303   |
| West Virginia.....  | 3   | 3   | 0  | 580    | 100   |
| Virginia.....       | 17  | 7   | 10 | 5,670  | 642   |
| North Carolina..... | 1   | 0   | 1  | none   | 60    |
| Georgia.....        | 3   | 3   | 0  | 773    | 50    |
| Alabama.....        | 8   | 6   | 2  | 6,249  | 210   |
| Kentucky.....       | 9   | 7   | 2  | 9,036  | 300   |
| Tennessee.....      | 12  | 6   | 6  | 9,615  | 500   |
| Ohio.....           | 16  | 15  | 1  | 17,236 | 1,679 |
| Michigan.....       | 18  | 11  | 5  | 16,254 | 661   |
| Wisconsin.....      | 10  | 6   | 4  | 3,805  | 370   |
| Missouri.....       | 5   | 5   | 0  | 10,500 | 600   |
| Total.....          | 147 | 105 | 42 | 99,076 | 6,209 |

*Complete Table by States.*

|                     |     |     |     |         |        |
|---------------------|-----|-----|-----|---------|--------|
| Maine.....          | 1   | 1   | 0   | 400     | none   |
| Vermont.....        | 2   | 1   | 1   | 500     | 80     |
| Massachusetts.....  | 2   | 1   | 1   | 536     | 45     |
| Connecticut.....    | 7   | 6   | 1   | 3,632   | 78     |
| New York.....       | 33  | 26  | 7   | 31,116  | 382    |
| New Jersey.....     | 11  | 5   | 6   | 12,332  | 60     |
| Pennsylvania.....   | 152 | 100 | 52  | 91,681  | 3,419  |
| Maryland.....       | 15  | 12  | 3   | 10,801  | 673    |
| Virginia.....       | 21  | 9   | 12  | 6,970   | 867    |
| West Virginia.....  | 5   | 5   | 0   | 4,255   | 179    |
| North Carolina..... | 1   | 0   | 1   | none    | 60     |
| Georgia.....        | 3   | 3   | 0   | 773     | 50     |
| Alabama.....        | 8   | 6   | 2   | 6,249   | 210    |
| Kentucky.....       | 11  | 8   | 3   | 12,150  | 300    |
| Tennessee.....      | 12  | 6   | 6   | 9,615   | 500    |
| Ohio.....           | 48  | 32  | 16  | 47,797  | 2,898  |
| Indiana.....        | 7   | 0   | 7   | 10,378  | 500    |
| Illinois.....       | 5   | 1   | 4   | 11,710  | 200    |
| Michigan.....       | 18  | 12  | 6   | 21,254  | 666    |
| Wisconsin.....      | 13  | 7   | 6   | 6,805   | 470    |
| Missouri.....       | 10  | 6   | 4   | 19,476  | 885    |
| Total.....          | 385 | 247 | 138 | 308,430 | 12,522 |

*Recapitulation.*

|                                   |     |     |     |         |        |
|-----------------------------------|-----|-----|-----|---------|--------|
| Charcoal.....                     | 147 | 105 | 42  | 99,076  | 6,209  |
| Anthracite.....                   | 126 | 83  | 43  | 83,340  | 2,686  |
| Bituminous coal and coke.....     | 105 | 56  | 49  | 117,414 | 3,287  |
| Coke and anthracite coal.....     | 4   | 2   | 2   | 8,000   | 185    |
| Bituminous coal and charcoal..... | 3   | 1   | 2   | 600     | 175    |
| Total.....                        | 385 | 247 | 138 | 308,430 | 12,522 |

From the foregoing tables it will be seen how severely the two leading branches of the iron trade were affected by the panic at the

beginning of the new year. Over 30,000 hands were wholly unemployed, and over 10,000 were employed only a part of their time. From a trustworthy source we also learn that there were in New York at the beginning of the year over 40,000 tons of foreign rails unsold. Statistics in our possession also show that the wages of all iron workers had been largely reduced, and that such few mills as had been able to make sales of rails had been compelled to accept offers averaging twenty-five per cent. below the prices which had prevailed before the panic. These figures do not require comment at our hands, but they should receive the careful consideration of Congress and the country.

## IRON ORE STATISTICS.

The quantity of iron ore shipped from the Lake Superior region during the year 1873, according to the *Marquette Mining Journal*, was 1,178,879 gross tons, against 952,055 gross tons in 1872. Increase, 226,824 tons. These figures only represent shipments, and do not include the ore consumed in the production of 63,195 gross tons of pig iron in the district in 1872, and 71,507 tons in 1873. It should not be inferred that the difference between the ore *product* of 1872 and 1873 is correctly expressed by the figures above given; for nearly all of the ore produced in 1872 was shipped to greedy buyers, so great was the demand for pig iron, but much of the ore actually mined in 1873 was not shipped, owing to the panic and other causes. Much of the ore shipped in 1873 is now on the wharves at Cleveland, unsold.

Four mines unitedly shipped over 500,000 gross tons of ore in 1873: Lake Superior, 166,666 tons; Cleveland, 132,082 tons; Jackson, 113,892 tons; and Republic, 105,453 tons. These were closely followed by the Champion mine, 72,782 tons, and the New York mine, 70,882 tons. Shipments were made from forty-two mines during the year. The estimated value at the ports of shipment of all the ore shipped was \$8,141,000.

The price at Cleveland of first-class Lake Superior specular ore at the beginning of 1873 was about \$12. After the panic the price fell to \$10. The probability is that the price for 1874 will be about \$9.

The statistics of the production of Missouri ore are withheld by the operators. The price of Iron Mountain ore delivered at St. Louis was \$10 in 1873 prior to the panic. It is announced that the price of the same ore for 1874 has been fixed at \$8, delivered at St. Louis.

#### MILES OF RAILROAD IN OPERATION, JANUARY 1, 1874.

From Mr. H. V. Poor, editor of Poor's Manual, we have received the following table showing the number of miles of railroad in operation January 1, 1874. From those States marked with a star official returns have been received.

| STATE.                 | Miles | STATE.                 | Miles  |
|------------------------|-------|------------------------|--------|
| Maine.....             | 915   | Wyoming Territory..... | 459    |
| New Hampshire.....     | 877   | Utah*.....             | 372    |
| Vermont*.....          | 721   | Dakota.....            | 234    |
| Massachusetts*.....    | 1,755 | Colorado*.....         | 603    |
| Rhode Island*.....     | 159   | Indian Country.....    | 279    |
| Connecticut.....       | 897   | Virginia.....          | 1,573  |
| New York.....          | 5,165 | North Carolina.....    | 1,265  |
| New Jersey.....        | 1,418 | South Carolina.....    | 1,378  |
| Pennsylvania.....      | 5,550 | Georgia.....           | 2,260  |
| Delaware.....          | 264   | Florida.....           | 466    |
| Maryland and D. C..... | 1,048 | Alabama*.....          | 1,722  |
| West Virginia.....     | 576   | Mississippi.....       | 990    |
| Ohio*.....             | 4,258 | Louisiana.....         | 539    |
| Michigan*.....         | 3,350 | Texas.....             | 1,578  |
| Indiana.....           | 3,714 | Kentucky.....          | 1,320  |
| Illinois*.....         | 6,589 | Tennessee.....         | 1,620  |
| Wisconsin.....         | 2,203 | Arkansas.....          | 700    |
| Minnesota.....         | 1,950 | California.....        | 1,290  |
| Iowa.....              | 3,736 | Oregon.....            | 251    |
| Kansas*.....           | 2,100 | Nevada.....            | 629    |
| Nebraska.....          | 1,051 | Washington Ter'y.....  | 105    |
| Missouri*.....         | 2,858 |                        |        |
|                        |       | Total.....             | 70,785 |
| Total, 1872.....       |       |                        | 68,826 |
| Increase.....          |       |                        | 3,959  |

The total number of miles of railroad constructed in 1873 was 6,427; in 1873 there were only 3,959 constructed. There will be fewer miles built in 1874 than in 1873, unless Congress comes to the aid of railroad enterprises of national importance, work upon which has been almost wholly suspended.

#### BRITISH IRON PRODUCTION.

The quantity of pig iron produced in Scotland in 1873 was 993,000 tons, which was 97,000 tons less than the production of 1872, which was 1,090,000 tons. The stock on hand at the close of the year was 120,000 tons, or 74,000 tons less than the stock on hand at the close of 1872. The average price of Scotch pig iron for 1873 was 117s. 3d., or about 15s. above the average for 1872. Notwithstanding the high prices obtained, the

make was not only greatly restricted below the product of 1872, but the quantity exported to foreign countries, owing to the prevalence of these high prices, was only 398,850 tons, against 616,933 tons in 1872. The decreased production of Scotch pig iron during the past three years is due partly to labor complications, but mainly to the increased scarcity of the splint coal and blackband ironstone, which have given this iron its excellent reputation. The product has very greatly fallen off since 1870, when the maximum production of 1,206,000 tons was obtained.

The Cleveland district of England produces about one-third of all the pig iron of Great Britain. In 1873 the product of this district was 1,999,491 tons, showing only a slight increase upon the make of 1872, which was 1,968,072 tons. The average price of Cleveland pig iron in 1873 was about 110s. a ton, against an average of 100s. in 1872. The stock of Cleveland pig iron in makers' hands on the 31st of December last was 80,328 tons, an increase of 40,000 tons over the total stock on hand at the close of 1872.

During the latter part of the year 1873 there was a slight decline in the cost of fuel and labor in the iron districts of Great Britain, and this decline at the date of our latest advices promised to be permanent. The year 1874 will doubtless witness lower prices for iron in British markets than prevailed in 1873. This view is strengthened by the downward tendency of prices on the Continent.

The statistics of the British iron trade for the past seven years have been admirably summarized by Messrs. Wm. Fallows & Co., of Liverpool, and will be found below:

| Year. | Production of pig iron in Great Britain. | Average price of Scotch pig iron. | Total stock, Dec. 31, in Scotland and North of England. | Total exports of Iron of all kinds. |            |
|-------|------------------------------------------|-----------------------------------|---------------------------------------------------------|-------------------------------------|------------|
|       |                                          |                                   |                                                         | Quantity                            | Value.     |
|       | Tons.                                    |                                   | Tons.                                                   | Tons.                               | £          |
| 1867. | 4,761,023                                | 52s. 6d.                          | 644,345                                                 | 1,968,025                           | 15,050,391 |
| 1868. | 4,970,206                                | 52s. 9d.                          | 720,927                                                 | 2,041,552                           | 15,036,398 |
| 1869. | 5,445,757                                | 53s. 3d.                          | 736,607                                                 | 2,675,351                           | 19,519,201 |
| 1870. | 5,963,515                                | 54s. 4d.                          | 782,345                                                 | 2,825,575                           | 24,038,090 |
| 1871. | 6,827,179                                | 59s. 0d.                          | 558,331                                                 | 3,169,219                           | 26,124,134 |
| 1872. | 6,741,929                                | 101s. 10d.                        | 235,628                                                 | 3,382,762                           | 35,996,107 |
| 1873. | 6,850,000*                               | 117s. 3d.                         | 200,328                                                 | 2,959,314                           | 57,779,585 |

\* Estimated.

The number and location of all the blast

furnaces of Great Britain are copied below from the Middlesbrough *Iron and Coal Trades Review*:

| DISTRICTS.                    | BUILT. | IN BLAST. |
|-------------------------------|--------|-----------|
| Cleveland.....                | 104    | 98        |
| Northeast of England.....     | 37     | 35        |
| Northwest of England.....     | 84     | 64        |
| South Staffordshire.....      | 166    | 109       |
| North Staffordshire.....      | 42     | 31        |
| Shropshire.....               | 29     | 21        |
| Yorkshire—West Riding.....    | 49     | 33        |
| Derbyshire.....               | 52     | 45        |
| Northampton and Lincoln.....  | 28     | 17        |
| Gloucester, Wilts, etc.....   | 18     | 12        |
| North Wales.....              | 15     | 8         |
| South Wales and Monmouth..... | 191    | 126       |
| Scotland.....                 | 154    | 122       |
| Total.....                    | 969    | 721       |

#### SHIPBUILDING ON THE CLYDE.

The following figures show the number and tonnage of vessels built on the Clyde during the past four years:

| Year.     | Vessels. | Tons.   |
|-----------|----------|---------|
| 1870..... | 234      | 189,800 |
| 1871..... | 231      | 196,200 |
| 1872..... | 227      | 224,000 |
| 1873..... | 194      | 261,500 |

It will be noticed that the number of vessels built in 1873 was much less than in any of the three preceding years, but that the tonnage exhibited a considerable increase. The number of vessels contracted for at the close of 1873 was, however, considerably smaller than that for either of the two preceding years. It embraced 140 vessels of 216,000 tons. Of the vessels launched in 1873 many were of very heavy tonnage—vessels of 3,000, 3,200, 3,500, 4,000 and 4,250 tons being common, while vessels measuring 4,700, 4,800 and 4,820 tons were also built. A vessel of 5,000 tons for the Inman line is now in hand. There was an increase during 1873 in the number of iron sailing vessels launched.

#### THE BRITISH COAL TRADE OF 1873.

The circular of Mr. C. E. Muller, dated January 14th, 1874, has the following information: "The drift of the coal trade during 1873 has just been a reflex of the iron trade. Best coal in January was 18s. per ton, advancing in spring to 21s. and 23s. per ton, subsiding again towards midsummer, and closing about 18s. in December. Unscreened coal for manufacturing purposes is about 16s. per ton. Coke in January last was 39s. per ton, advancing in March, April, and May, to

as high as 45s. In June the fall commenced by a drop of 5s. per ton, continuing gradually till, at close of the year, the price was 30s. to 32s. 6d. at the furnaces."

#### BRITISH IRON EXPORTS.

The subjoined table exhibits the course of the British iron trade during the three memorable years just passed—1871, 1872, and 1873: compiled from the British Board of Trade Returns: tons of 2240 pounds.

| PRINCIPAL ARTICLES.                                                             | QUANTITIES. |           |           |
|---------------------------------------------------------------------------------|-------------|-----------|-----------|
|                                                                                 | 1871.       | 1872.     | 1873.     |
| To all countries.                                                               | Tons.       | Tons.     | Tons.     |
| Pig iron.....                                                                   | 1,057,453   | 1,331,143 | 1,139,664 |
| Bar, angle, bolt and rod                                                        | 349,084     | 313,600   | 283,422   |
| Railroad of all sorts.....                                                      | 981,197     | 945,420   | 786,800   |
| Wire of iron and steel (except telegraph) galvanized or not.....                | 26,200      | 33,540    | 29,884    |
| Hoops, sheets, boiler and armor plates.....                                     | 200,337     | 207,495   | 201,487   |
| Cast or wrought, and all other manufactures (except ordnance) unenumerated..... | 243,298     | 269,607   | 282,165   |
| Iron, old, for remanufacture.....                                               | 139,812     | 107,521   | 60,478    |
| Steel, unwrought.....                                                           | 39,189      | 44,969    | 39,488    |
| Manufactures of steel, or steel and iron combined                               | 13,038      | 11,384    | 10,508    |
| Total of iron and steel...                                                      | 3,169,219   | 3,382,762 | 2,959,314 |
| Steam engines.....                                                              |             |           |           |
| Other machinery and mill work.....                                              |             |           |           |

| PRINCIPAL ARTICLES                                                              | VALUE.     |            |            |
|---------------------------------------------------------------------------------|------------|------------|------------|
|                                                                                 | 1871.      | 1872.      | 1873.      |
| To all countries.                                                               | £          | £          | £          |
| Pig iron.....                                                                   | 3,229,408  | 6,712,579  | 7,075,478  |
| Bar, angle, bolt and rod                                                        | 2,921,777  | 3,632,818  | 3,749,765  |
| Railroad of all sorts.....                                                      | 8,084,619  | 10,225,492 | 10,425,727 |
| Wire of iron and steel (except telegraph) galvanized or not.....                | 446,159    | 672,914    | 702,       |
| Hoops, sheets, boiler and armor plates.....                                     | 2,399,203  | 3,414,906  | 3,736,769  |
| Cast or wrought, and all other manufactures (except ordnance) unenumerated..... | 3,588,364  | 4,772,364  | 5,544,028  |
| Iron, old, for remanufacture.....                                               | 672,696    | 656,262    | 400,181    |
| Steel, unwrought.....                                                           | 1,193,428  | 1,478,737  | 1,463,857  |
| Manufactures of steel, or steel and iron combined                               | 682,855    | 623,122    | 723,726    |
| Total of iron and steel...                                                      | 26,124,134 | 35,996,167 | 37,779,586 |
| Steam engines.....                                                              | 2,064,004  | 2,594,996  | 2,952,879  |
| Other machinery and mill work.....                                              | 3,902,037  | 5,606,116  | 7,041,290  |

It will be observed that the quantity of iron and steel exported from Great Britain in 1873 was less than in either of the years 1871 and 1872, while the value was almost forty-five per cent. greater than in 1871 and almost five per cent. greater than in 1872. Undoubtedly 1873 was a more prosperous year for the iron trade of Great Britain than 1872, notwithstanding the fact that fuel was higher in price

and labor was more imperious in its demands. Nevertheless, the year which witnesses a decrease in the quantity of iron exported can not be regarded as an auspicious one for the British iron trade, for the customers once lost may never be regained. The following table presents a comparative statement of the shrinkage in quantities of certain articles exported in 1873 as compared with 1872:

| COMMODITIES.                  | QUANTITIES. |           |           |
|-------------------------------|-------------|-----------|-----------|
|                               | 1871.       | 1872.     | 1873.     |
| Pig Iron.                     | Tons.       | Tons.     | Tons.     |
| To United States.....         | 190,183     | 195,151   | 102,624   |
| " Germany.....                | 203,284     | 310,597   | 261,642   |
| " Holland.....                | 246,092     | 352,895   | 330,398   |
| " France.....                 | 71,265      | 90,234    | 89,156    |
| " Other countries.....        | 346,634     | 382,266   | 355,844   |
| Total to all countries.....   | 1,057,458   | 1,331,143 | 1,139,664 |
| Bar, angle, bolt and rod.     |             |           |           |
| To United States.....         | 64,301      | 64,583    | 23,006    |
| " British N. America...       | 45,146      | 46,536    | 31,339    |
| Total to these countries..... | 109,447     | 111,119   | 54,345    |
| Railroad of all sorts.        |             |           |           |
| To United States.....         | 512,277     | 467,304   | 185,702   |
| " Germany.....                | 50,287      | 50,105    | 41,984    |
| " Austria.....                | 24,260      | 7,989     | 816       |
| " British N. America...       | 61,961      | 77,255    | 54,573    |
| " Brazil, Peru and Chili      | 60,911      | 59,909    | 29,361    |
| Total to these countries..... | 709,696     | 662,562   | 312,436   |
| Steel unwrought.              |             |           |           |
| To United States.....         | 21,133      | 23,821    | 19,262    |
| " France.....                 | 1,764       | 3,204     | 2,544     |
| " Other Countries.....        | 16,292      | 17,944    | 17,682    |
| Total to all countries.....   | 39,189      | 44,969    | 39,488    |

The diminished exports of bar, angle, bolt and rod to the United States and British North America in 1873 are fairly balanced by the increased demand from Germany, Holland, Italy, British India, and other countries. The shrinkage in the shipments of railroad iron to the countries named above is partly compensated by the increased shipments to Russia, Sweden and Norway, Holland, Australia, and some other countries. The Russian demand for British railroad iron has been somewhat remarkable. In 1871 there were imported 78,367 tons; in 1872 there were imported 106,939 tons; in 1873 there were imported 163,275 tons, or more than double the quantity taken in 1871. But for the large Russian demand it will be seen that

there would have been a positive collapse in British railroad iron in 1873.

Notwithstanding the fact that the year 1873 was a prosperous one for British ironmasters, they must have regarded with some alarm the statistics of the iron export trade for the last month of the year. Compared with the month of December of 1872, the exhibit is far from encouraging. The following table shows a decrease of exports in both quantity and value in almost every item mentioned:

| Principal Articles.                          | Month of December. |         |           |           |
|----------------------------------------------|--------------------|---------|-----------|-----------|
|                                              | Quantities.        |         | Value.    |           |
|                                              | 1872.              | 1873.   | 1872.     | 1873.     |
|                                              | Tons.              | Tons.   | £         | £         |
| Pig iron.....                                | 101,235            | 67,402  | 572,634   | 400,479   |
| Bar, angle, bolt, etc...                     | 19,385             | 19,269  | 243,316   | 257,003   |
| Railroad.....                                | 65,938             | 49,550  | 809,686   | 677,444   |
| Wire (except telegraph)                      | 2,753              | 2,306   | 62,413    | 64,971    |
| Hoops, sheets and plates.....                | 16,982             | 13,077  | 300,312   | 247,670   |
| Cast or wrought.....                         | 22,059             | 18,159  | 413,483   | 387,421   |
| Old iron.....                                | 9,049              | 1,791   | 53,776    | 12,132    |
| Steel, unwrought.....                        | 3,684              | 2,262   | 131,246   | 89,432    |
| Manufactures of steel or steel and iron..... | 763                | 728     | 47,566    | 52,001    |
| Total of iron and steel                      | 248,829            | 182,038 | 2,861,636 | 2,407,102 |
| Steam engines.....                           |                    |         | 224,738   | 206,371   |
| Other machinery and mill work.....           |                    |         | 506,773   | 545,405   |

The exports of iron and steel from Great Britain to the United States during the years 1871, 1872, and 1873 are given in the following table:

| PRINCIPAL ARTICLES.           | Quantities. |           |           |
|-------------------------------|-------------|-----------|-----------|
|                               | 1871.       | 1872.     | 1873.     |
| To United States.             | Tons.       | Tons.     | Tons.     |
| Pig Iron.....                 | 190,183     | 195,151   | 102,624   |
| Bar, angle, bolt and rod..... | 64,301      | 64,583    | 23,006    |
| Railroad of all sorts.....    | 512,277     | 467,304   | 185,702   |
| Hoops, sheets and plates..... | 41,520      | 31,407    | 18,291    |
| Cast or wrought.....          | 10,671      | 13,468    | 22,279    |
| Steel, unwrought.....         | 21,133      | 23,821    | 19,262    |
| Total.....                    | 840,085     | 795,734   | 371,164   |
| PRINCIPAL ARTICLES.           | Value.      |           |           |
|                               | 1871.       | 1872.     | 1873.     |
| To United States.             | £           | £         | £         |
| Pig iron.....                 | 594,086     | 1,017,123 | 693,794   |
| Bar, angle, bolt and rod..... | 534,205     | 745,681   | 308,238   |
| Railroad of all sorts.....    | 3,976,857   | 4,812,866 | 2,428,061 |
| Hoops, sheets and plates..... | 409,886     | 427,003   | 303,916   |
| Cast or wrought.....          | 180,005     | 308,551   | 439,897   |
| Steel, unwrought.....         | 620,537     | 769,558   | 705,392   |
| Total.....                    | 6,315,376   | 8,081,682 | 4,879,208 |

## PROCEEDINGS OF THE UNION CONFERENCE.

In accordance with previous arrangement, committees representing various national iron and steel associations met in Parlor C, of the Continental Hotel, Philadelphia, at 9 o'clock, P. M., February 4th, for the purpose of forming a union of all the associations. Wm. Firmstone, Esq., was called to the chair, and Wm. E. S. Baker and James M. Swank were chosen secretaries. The following committees were present:

*Representing the National Association of Iron Manufacturers*—Messrs. James I. Bennett, Oliver Williams, J. C. Lewis, Wm. E. S. Baker, Nathan Rowland, George L. Reis, Charles L. Bailey, Clement B. Smythe.

*Representing the American Pig Iron Manufacturers' Association*—Messrs. Wm. Firmstone, J. H. Maxson, Charles J. Nourse, George Fuller, C. B. Herron, and Chester Griswold.

*Representing the American Iron and Steel Association*—Messrs. Daniel J. Morrell, Joseph Wharton, Samuel J. Reeves, Cyrus Elder, John Rogers, J. B. Moorhead, G. B. Stebbins, Percival Roberts, and W. E. C. Coxe.

The following proposition for consolidation was presented for consideration by the committee representing the American Iron and Steel Association:

*Whereas*, The business of collecting and publishing statistics of production, and information concerning new inventions and processes, in all branches of iron and steel manufacture, and of caring for the general interests of the whole trade and contributing and dependent industries, can best be performed by a single association, which shall be national in name and character; therefore

*Resolved*, That the several associations of iron and steel manufacturers be asked to commit to the American Iron and Steel Association the general duties above referred to, and that their members are cordially invited to become members of the American Iron and Steel Association, with the understanding that the reorganized body will be made generally representative of all iron and steel interests.

Mr. Bennett, on behalf of the committee of the National Iron Association, offered the following resolution, which, after discussion, was unanimously adopted by a yea and nay vote of all the gentlemen representing the two associations which had been requested

to unite with the American Iron and Steel Association:

*Resolved*, That the National Association of Iron Manufacturers and the American Pig Iron Manufacturers' Association unite with the American Iron and Steel Association upon the terms proposed by its committee.

After the adoption of this resolution, Mr. Bennett submitted the following series of resolutions, which were separately adopted by a unanimous vote of all the committees participating in the conference:

*Resolved*, That the union of the National Association of Iron Manufacturers, the American Pig Iron Manufacturers' Association, and the American Iron and Steel Association be now formally declare to be complete under the name of the American Iron and Steel Association.

*Resolved*, That the Secretary of the National Association of Iron Manufacturers, and the Secretary of the American Pig Iron Manufacturers' Association be requested to give to the Secretary of the American Iron and Steel Association the names of members in good standing in their respective associations, to be entered as members of the American Iron and Steel Association.

*Resolved*, That the constitution of the American Iron and Steel Association be formally adopted as the constitution of the reorganized body.

*Resolved*, That the American Iron and Steel Association meet on Thursday, Feb. 5, at the Continental Hotel, for the transaction of business, and that all other iron and steel manufacturers in the city be invited to be present.

After the adoption of the resolutions, a committee representing the National Association of Nail Manufacturers entered the Parlor, and through their chairman, Mr. R. E. Blankenship, announced that their Association had this evening under consideration the propriety of uniting with the other national associations, and had concluded that it was not expedient to unite at present, but that the subject would receive their further consideration. The committee was composed as follows—

Messrs. R. E. Blankenship, James C. Lewis, H. P. Tobey, Andrew Wheeler, and Charles L. Bailey.

The draft of a proposed memorial to Congress was submitted by Mr. Morrell for the consideration of the conference, and after discussion was ordered to be reported to the Association at its meeting on the following day. On motion, the conference adjourned.

## MEETING AT THE CONTINENTAL HOTEL.

At eleven o'clock, on the morning of the 5th inst., the Association assembled at the Continental Hotel, the spacious Parlor C having been secured for this purpose. There were also present many members of other iron and steel organizations, who had been requested to meet with the Association in joint convention on this day. The venerable David Thomas, of Catasauqua, was called upon to preside over the temporary deliberations of the assembly, and James M. Swank was appointed Secretary.

In order to perfect the union formed on the preceding evening, Mr. Bennett moved the adoption of the following resolution:

*Resolved*, That a standing committee of five persons be selected by the persons present to represent each of the branches of the iron and steel industry embraced in this Association, whose duty it shall be to take charge of all matters relating to their respective interests, and who shall have power to call meetings of their respective branches whenever deemed necessary.

The resolution was adopted, and the following standing committees were at once designated by the members of the various branches:

Committee on Bar Iron—James C. Lewis, Pittsburgh, Pa.; O. Williams, Catasauqua, Pa.; R. McCarthy, Syracuse, N. Y.; Nathan Rowland, Philadelphia; George L. Reis, Newcastle, Pa.

Committee on Pig Iron—C. J. Nourse, Columbia, Pa.; G. Fuller, Boonton, N. J.; J. H. Maxson, St. Louis, Missouri; A. B. Cornell, Albany, N. Y.; H. N. Braem, Poughkeepsie, N. Y.

Committee on Plate Iron—James I. Bennett, Pittsburgh, Pa.; Dr. Charles Huston, Coatesville, Pa.; C. H. Ashburner, Baltimore, Md.; C. L. Bailey, Pottstown, Pa.; W. R. McIlvaine, Reading, Pa.

Committee on Railroad Iron—Daniel J. Morrell, Johnstown, Pa.; Captain E. B. Ward, Detroit, Mich.; S. A. Fuller, Cleveland, Ohio; Chester Griswold, Troy, N. Y.; W. E. C. Coxe, Reading, Pa.

Mr. Williams moved the adoption of the following resolution:

*Resolved*, That the organization of the American Iron and Steel Association be now thoroughly perfected by the election of the present officers of that organi-

zation to serve as officers of the new Association for the current year.

The resolution was unanimously agreed to, whereupon Mr. Reeves, President of the Association, took the chair which Mr. Thomas had vacated upon the adoption of this motion. After a few remarks by the President, expressing the pleasure he experienced at his being selected to preside over the united associations, and uttering the hope that hereafter these great branches of the iron industry of the United States might work in perfect unison, the Association proceeded to the consideration of matters of business.

On motion of Mr. Wharton, the members of the several committees representing the various interests embraced in the American Iron and Steel Association were added to the Executive Committee of the Association.

At the suggestion of Mr. Moorhead, a general invitation was extended to all persons present, interested in the manufacture of iron or steel, to participate in the discussions of the Association, and to vote upon all questions submitted for decision.

Hon. Henry C. Carey having entered the room, Mr. Stebbins offered the subjoined resolution in compliment to the distinguished visitor:

*Resolved*, That we gladly recognize in our meeting and welcome to our deliberations Henry C. Carey of Philadelphia, the wise, learned, and humane political economist, the early and steadfast friend of our iron and steel industry, as well as of every other industry of our country.

The resolution was adopted with hearty expressions of approval. Mr. Morrell called up the consideration of the memorial to Congress, which, after slight amendment, was unanimously adopted as follows:

*To the Honorable the Senate and House of Representatives of the United States of America, in Congress assembled:*

The undersigned, representatives of all the iron and steel industries of the United States, in convention assembled, beg leave to address briefly your honorable bodies upon questions of public interest now awaiting your consideration and action, in which, as managers of

a large amount of invested capital, and employers of many workmen, they feel a most profound concern. In common with other manufacturers, they were seriously embarrassed and obliged to partially or wholly suspend operations by the financial panic of last September, which overtook them at a time when they were making satisfactory progress, and were in apparent enjoyment of assured prosperity. It inflicted upon them great direct loss, and they must for a long time suffer from its injurious consequences. Though money is again becoming plentiful and business is reviving, the iron and steel industries are still seriously embarrassed, and in some branches which suffered most no improvement is yet manifested. Your memorialists, believing in the duty of self-help, have studied to introduce economies, and, as far as possible, to adjust their operations to the changed condition of affairs. They endure patiently the season of general calamity, asking no special sympathy or aid, but awaiting with confidence such measures of general relief as Congress, in its wisdom, may devise for the benefit of the country. They believe that you will be willing to be aided in this important labor by such advice as their observation and experience suggest, and therefore express their views touching certain projects of legislation without reserve.

A bill has been introduced into the House of Representatives to repeal the second section of the act of June 6, 1872, which made a reduction of ten per cent. in the duties on a large number of staple articles, and which tended to discourage home production, while affecting most injuriously the public revenue. Your memorialists strongly urge the passage of this repealing act, not merely as a protective measure, but for the benefit of the national Treasury. Though it may not be directly helpful to them, this action will be morally encouraging to manufacturers and workingmen, as showing that the Government prefers to make up the deficit in its revenues from the profits of foreign traders rather than by taxes upon its own citizens.

The propositions presented for your consideration to amend the tariff laws, by exclud-

ing the cost of packages and shipping charges from the invoice value of foreign goods, upon which duties are to be assessed, and allow appraisers to take the cost of goods at the place of shipment, as a basis of valuation, should not be regarded with favor, and your memorialists, representing that these proposed changes would disturb regulations which are well understood, and would prove injurious to the revenue, and to all domestic industries, most earnestly protest against their adoption.

Your memorialists adopt and reaffirm the resolution of the American Iron and Steel Association at its last annual meeting, that the power given to a single creditor under the present bankrupt law to force a debtor into bankruptcy, against the will and to the injury of all others having claims upon the estate, is unjust in principle and disastrous in practice, and the law should be so amended as to give to three-fourths of the creditors, in interest, the right to control the settlement of the affairs of an insolvent, and to prevent them from being subject to proceedings in bankruptcy.

Your memorialists feel much anxiety concerning the bill embodying the revised and codified laws of the United States now pending in the House of Representatives. They have learned that it is not an exact transcript of existing statutes, and they fear that the slightest changes in the schedules of customs duties may be most injurious to business interests and the public revenue. They respectfully suggest that the tariff laws should be omitted from the revised code, until reformed by the passage of the repealing act, hereinbefore prayed for, by the conversion of ad valorem into specific duties, and the enlargement of the free list in so far as it can be effected without detriment to the industries of the country. If this delay can not be granted, they would ask that so much of the revised code as relates to duties and taxes may be examined by competent experts, and published for the information of the country before it is finally adopted.

Your memorialists, sympathizing with the general wish that the Government may be brought into more intimate relations with

the people, which has suggested the erection of executive bureaus of labor, transportation, etc., and of a department of commerce, would recommend the creation of a department of industry, having for its head a Cabinet officer to be entitled the Secretary of Industry, which department shall contain bureaus of agriculture, manufactures and commerce. These three natural grand divisions of human labor should have equal regard bestowed upon them, and their harmonious organization as above suggested seems as necessary as it is symmetrical. Under it, every business question which becomes a subject of national concern may have appropriate reference, Congressional committees will be relieved of some part of their most onerous labors, and there will be less danger of partial or negligent legislation.

Your memorialists substantially concur in the opinion that legislation is needed not only for the present relief of the country and the Treasury, but also to guard as far as possible against financial troubles in future. Panics and periods of general prostration of business have occurred from time to time in all commercial countries. Different financial systems seem alike liable to them, and they are quite as frequent and disastrous when coin is the standard of payment as when a mixed currency or paper alone is employed. Your memorialists believe that the history of the country, since the close of the late civil war, shows that its financial system, built up under the stress of circumstances which strained to the utmost the credit and resources of the nation, is well adapted to the needs of the Government and the people, and instead of discarding any of its elements they would preserve, reform and perfect it. To this end they would recommend the following measures, First, Limitation of the issue of legal-tender notes to \$400,000,000. Second, Repeal of the limitation upon the currency, and freedom of bank circulation under the national banking laws, subject to such regulations as will tend to afford at all times and to all parts of the country an adequate supply of currency for the needs of legitimate business, and to prevent such periodical and local gluts as lead to injurious

speculation. Third, Consolidation of the national debt in a loan bearing a low rate of interest, which shall be the sole basis of banking, and may be redeemed and retired only by purchase in open market by the Government.

Commending these matters to your consideration, your memorialists would further represent that the great development of their industries, which are now almost or quite adequate in productive power to the wants of the country, is directly attributable to the tariff policy of the Government, under which well rewarded labor has grown in intelligence, skill and efficiency, and improvements have been made in machinery and processes which are of inestimable value. Believing that you feel a just pride in this healthful progress, and would grieve to see it sustain even a temporary check, we trust that you will firmly adhere to that general policy of protection to home industry which has made the nation powerful and its people prosperous.

On motion of Mr. Moorhead, it was ordered that the memorial should be printed and that the officers and members of the Association should sign it.

The suggestion by Mr. Williams, that the chairmen of the standing committees representing the different branches of the Association should sign the memorial, was adopted, and on motion of Mr. Wharton, representatives of the other branches of the iron and steel trades were requested to join in signing it. [It has been found to be impossible to comply with these requests. The memorial could not be engrossed until after most of the gentlemen had left the city.]

The following resolution was presented by Mr. Stebbins:

*Whereas*, It is of the highest importance that the qualities of iron ores be well known in order that the quality and cost of iron made therefrom can be correctly determined; and

*Whereas*, The want of any accurate system in this matter, and the large demand for ores in the past few years, have led to a want of care in assorting and to a lowering of the standard of purity detrimental to all interested; therefore,

*Resolved*, That we urge a more careful assorting of kinds, and a more critical classification of qualities and percentage of iron in the ores, as of great importance to producer and consumer.

The resolution was adopted on motion of Mr. Durfee.

Mr. Williams offered a resolution deprecating the formation of trades unions, and expressing the hope that the time might never come when it would seem to be necessary to form a federation of employers to protect their interests, as has recently been done in Great Britain. After a prolonged and very animated discussion, the resolution was withdrawn.

Mr. Durfee presented the following resolution, moving its adoption:

*Whereas*, The cost of the iron in railroads and rolling stock is about one-third of the total cost of such roads; and

*Whereas*, The demand for iron for railroad-building is by far the largest upon which ironmasters depend for their business; and

*Whereas*, The mutual interdependence of the railroads and iron-makers, both as to construction on the one hand and employment on the other, is such that there can be no cessation of the one without a cessation of the other; therefore

*Resolved*, That a committee of this Association be appointed to consider whether the iron-makers of the country as a whole can do anything to develop new railroads and to effect a cheapening of the cost of such construction.

The resolution was referred to the Executive Committee.

Mr. Wharton moved the adoption of the following resolution, which was done:

*Resolved*, That each person present be requested to give his name and address to the Secretary, before leaving, in order that such names may be placed on record.

On motion of Mr. Coxé, the Association passed the appended resolution:

*Resolved*, That this meeting cordially approves the proposed exhibition of iron ores and products at the Centennial Exhibition, and that we promise our individual co-operation to the American Iron and Steel Association in securing a just representation of the iron resources of the country.

Mr. Bennett moved the adoption of the annexed resolutions:

*Resolved*, That the general policy of employing a portion of the national revenue in the improvement of natural channels of trade and transportation, and of extending governmental aid to transcontinental lines of railroad, the construction of which involves greater risks and expense than private enterprise is willing to encounter, has been beneficial to the whole country; and we advise that such further aid be extended to unfinished national lines of road as will render productive the investments already made in them by the Government, and tend to improve the Western and

Southern States through which they extend, to revive business and give employment to labor now idle, with other resulting benefits to the people at large.

*Resolved*, That the satisfactory progress of shipbuilding in the United States, and the especial activity in the construction of iron vessels for ocean commerce, are satisfactory evidence of the beneficial operation of the registry laws, which should not be changed so as to allow free trade in ships, to the serious detriment of this growing industry, without conferring upon the carrying trade any real or permanent advantage.

The resolutions were submitted separately, and, a spirited discussion having developed the existence of a strong adverse sentiment, Mr. Durfee offered as a substitute for the first resolution the following:

*Resolved*, That this Association recognizes as important and necessary that the General Government should initiate and carry out a general system of internal improvements tending to reduce the costs of intercommunication between the various sections of the country, for passengers, raw material and products.

Continued opposition having been manifested, the substitute and the original resolution were both withdrawn. The second resolution of Mr. Bennett, referring to shipbuilding, was then passed.

The thanks of the Association were tendered the reporters present, on motion of Mr. Williams.

Mr. Thomas S. Blair made a few remarks, congratulating the members upon the very successful meeting that had been held, asserting that it was the largest assemblage of iron and steel manufacturers that had ever been seen in the United States, and expressing the hope that future conventions would be as harmonious in their deliberations as this had been.

An adjournment *sine die* was then effected at 2.30 p. m., the convention having been in session three and a half hours.

### *Partial List of Persons Present at the Meeting on Thursday.*

PIG IRON MANUFACTURERS AND IRON ORE MINERS.  
J. B. Moorhead & Jas. E. Thropp, Merion Furnaces  
J. B. Moorhead & Co., Conshohocken, Pa.  
S. H. Witherbee, Cedar Point Iron Co., Fletcherville  
Blast Furnace Co., Port Henry, N. Y.  
E. C. Peechin, Dunbar Iron Co., Dunbar, Pa.  
Thomas Struthers, Struthers Iron Co., Struthers' Station, O.  
E. & G. Brooke, Keystone Furnaces, Birdsboro, Pa.

Abm. S. Patterson, Montgomery Iron Co., Port Kennedy, Pa.

Chas. E. Coffin, Muirkirk Iron Co., Muirkirk, Md.  
Mason W. Burt, Mingo Iron Works Co., Mingo Junction, O.

— Neshannock Iron Co., Newcastle, Pa.

W. McConkey, Wrightsville Iron Co., Wrightsville, Pa.

Paris Haldeman, E. Haldeman & Co., Chickles Furnaces, Pa.

I. Lord, Richland Furnace Co., Chillicothe, O.

Wm. Firmstone, Glendon Iron Co., Easton, Pa.

H. G. Blackwell, Green Pond Iron Mining Co., 113 Broadway, New York.

G. L. Smith, Ulster Blast Furnaces, Elmira, N. Y.

C. S. Kauffman, Kauffman Furnace, Columbia, Pa.

D. O. & H. S. Hitner, Wm. Penn Furnaces, Conshohocken, Pa.

Z. P. Boyer, Schuylkill Iron Co., Ringgold Iron Co., Pottsville, Pa.

Jas. I. Bennett, Graff, Bennett & Co., Pittsburgh, Pa.

Orin C. Frost, Northern N. Y. Iron & Mining Co., Watertown, N. Y.

D. McCormick, Paxton Furnaces, Harrisburg, Pa.

#### BAR IRON, NAIL AND BLOOM MANUFACTURERS.

Hughes & Patterson, Delaware Rolling Mill, Philadelphia.

R. E. Blankenship, Old Dominion Iron and Nail Works, Richmond, Va.

Alex. Laughlin, Jr., American Iron Works, Pittsburgh, Pa.

W. O. Fayerweather, Passaic Rolling Mill Co., Paterson, N. J.

Geo. F. McCleane, Moorhead & Co., Soho Iron Mills, Pittsburgh, Pa.

Wm. W. Wood, Wood Brothers, Wood's Falls, N. Y.

Jacob Hornbrook, Wheeling Iron and Nail Co., Wheeling, W. Va.

W. W. Holloway, Aetna Iron and Nail Co., Bridgeport, Ohio.

Geo. L. Reis, Reis, Brown & Berger, Shenango Iron Works, Newcastle, Pa.

Jas. C. Lewis, Lewis, Bailey, Dalzell & Co., Vesuvius Iron Works, Pittsburgh, Pa.

James Morrison, Cohoes Rolling Mill, Troy, N. Y.

Manuel McShain, Rohrerstown Rolling Mill, Philadelphia.

Jay Hildreth, Rome Merchant Iron Mill, Rome, N. Y.

Wm. Arthur Coffin, Pembroke Iron Co., Franconia Iron and Steel Co., Boston, Mass.

John Ralston, Tamaqua Rolling Mill Co., Tamaqua, Pa.

N. Wilkinson, Riverside Iron Works, Dewey, Vance & Co., Wheeling, W. Va.

John Peck, Samsondale Iron Works, Haverstraw, N. Y.

— Diamond State Iron Co., Wilmington, Del.

J. H. Sternbergh, Reading Rolling Mill, Reading, Pa.

Perclval Roberts, Pencoyd Iron Works, Philadelphia.

W. S. Mead, Knoxville Iron Co., Knoxville, Tenn.

Wm. G. Nelson, Logan Iron and Steel Co., Lewistown, Pa.

John Rogers, J. & J. Rogers Iron Co., Blackbrook, N. Y.

Oliver Williams, Catasauqua Manufacturing Co., Catasauqua, Pa.

Wm. E. S. Baker, Duncannon Iron Co., Philadelphia.

#### RAIL MANUFACTURERS.

T. G. Nock, Rome Iron Co., Rome, N. Y.

John Fritz, Bethlehem Iron Co., Bethlehem, Pa.

Fred. J. Slade, N. J. Steel and Iron Co., Trenton, N. J.

Geo. E. B. Jackson, Portland Rolling Mill Co., Portland, Maine.

Wm. Lewis, Spuyten Duyvil Rolling Mill Co., Spuyten Duyvil, N. Y.

Morris McDonald, J. Bragdon & Co., New Albany Rolling Mill, New Albany, Ind.

A. J. Dull, Lochiel Rolling Mill Co., Harrisburg, Pa.

L. Worthington, Cincinnati Railway Iron Works, Globe Rolling Mill Co., Cincinnati, O.

W. E. C. Coxe, Philadelphia and Reading Rolling Mill, Reading, Pa.

Wm. Jones, Alliance Rolling Mill Co., Alliance, O.

S. A. Fuller, Cleveland Iron Co., Cleveland, O.

S. J. Reeves, Phoenix Iron Co., Phoenixville, Pa.

T. Guilford Smith, Union Iron Co., Buffalo, N. Y.

D. J. Morrell, Cambria Iron Co., Johnstown, Pa.

Cyrus Elder, " " "

G. B. Stebbins, Wyandotte Rolling Mill Co., Milwaukee Iron Co., North Chicago Rolling Mill Co., Detroit.

Chas. S. Hinchman, Pennsylvania Steel Co., Philadelphia.

Joseph Wharton, Bethlehem Iron Co., Philadelphia.

Chester Griswold, John A. Griswold & Co., Troy, N. Y.

Robert McCarthy, Delano Iron Co., Syracuse, N. Y.

Edwin Eldridge, Elmira Rolling Mill Co., Elmira, N. Y.

#### STEEL MANUFACTURERS.

Jacob Reese, Reese, Graff & Woods, Pittsburgh, Pa.

G. W. Barr, Miller, Barr & Parkin, Pittsburgh, Pa.

Jos. D. Weeks, Hussey, Wells & Co., Singer, Nimick & Co., Pittsburgh, Pa.

Thomas S. Blair, Shoenberger, Blair & Co., Pittsburgh, Pa.

Robert G. Bushnell, Park, Brother & Co., New York.

#### MISCELLANEOUS.

Emil Wenck, Schmeisser, Wenck & Co., Baltimore.

James C. Bayles, Editor "Iron Age," New York.

Z. S. Durfee, Pneumatic Steel Association, New York.

A. L. Holley, Brooklyn.

A. H. McFadden, 1201 Beach St., Philadelphia.

Henry C. Carey, Philadelphia.

James Henderson, New York.

David Thomas, Catasauqua, Pa.

J. B. Pearse, Philadelphia.

S. T. Bodine, Royers Ford Foundry, Royers Ford, Pa.

## OTHER MEETINGS.

A meeting of the National Association of Nail Manufacturers was held at the Continental Hotel on the afternoon of the 4th and on the morning of the 5th, before the assembling of the general convention. Mr. Thomas S. Blair, President of the Association, occupied the chair, and Mr. James C. Holden acted as Secretary.

Mr. Holden stated that the aggregate production of nails throughout the country for 1873 was 40,000 tons less than that of 1872, and 312,000 tons less than that of 1871, and that the stock of nails on hand on the 1st of January, 1874, was 32,000 tons less than on the 1st of January, 1873, and 30,000 more than on the 1st of January, 1872. There was a very general interchange of views as to the prospects of the nail manufacture for the present year, and it was elicited that there is a very large and increasing demand for nails in the markets of the West, while an increased demand in the Eastern markets is looked for at an early date. The general outlook was regarded as decidedly encouraging.

One very important matter affecting the nail interests was discussed and satisfactorily settled. Hitherto there has been great variation between the Eastern and Western classifications as to the lengths of different sorts of nails. It was decided to have one identical classification throughout the country, and the Western was adopted as the national classification.

The Association adjourned to meet again in Philadelphia in July next. Among the

prominent nail works represented at the meeting were the Fall River Nail Works, Tremont Nail Company, East Bridgewater Iron Company, Old Colony Iron Company, Wareham Nail Company, Robinson Iron Company, Weymouth Iron Company, Somerset Iron Company, Parker Mills, Providence Iron Company, J. & J. Rogers Iron Company, Boonton Iron Works, Oxford Iron Company, Duncannon Iron Company, Birdsboro' Nail Works, Pottstown Iron Company, Chesapeake Nail Works, Harrisburg Nail Works, Old Dominion Iron and Nail Works Company, Sable Iron Works, Juniata Iron Works, Vesuvius Iron Works, Clinton Iron and Nail Works, and New Castle Manufacturing Company.

On the afternoon of the 5th several manufacturers of railroad iron met at the same place, and determined to organize an association of the proprietors of rail mills east of Pittsburgh. Dr. Edwin Eldridge, of the Elmira Iron and Steel Rolling Mill Co., presided over the organization until permanent officers were elected. Mr. W. E. C. Coxe, of the Philadelphia and Reading Rolling Mill, was chosen President, and Mr. Frederick J. Slade, of the New Jersey Steel and Iron Co., Secretary.

The only business transacted was the passage of a resolution that the members of the Association should forward to the Secretary full lists of their labor prices, to be collected by him and furnished in tabular form, for their private information, to every member of the Association.

## THE BLAIR IRON AND STEEL PROCESS.

Remarks of Mr. Thomas S. Blair, of Pittsburgh, in explanation of his direct process for the manufacture of homogeneous iron and steel, delivered at the meeting on Wednesday, Feb. 4th.

Mr. Blair said: I beg leave to call the attention of members to the exhibits in the room and the ingot at the door, the latter being too heavy to bring up stairs.

The specimens marked "No. 1" are iron-sponge produced from the ores of Lake Superior and the Iron Mountain Mine of Missouri. By the process employed by the Blair Iron and Steel Co., the ores can be held under treatment for any length of time requisite to produce a nearly perfect elimination of the oxygen. It is this feature which gives this one of their products its value for

all purposes to which that form of iron can be applied, and especially for the open-hearth process, where any large ratio of iron-oxide would be inadmissible.

The specimens marked "No. 2" are blooms of about 6 inches diameter and 18 inches long. That marked "A" is produced by compressing the loose sponge in a cold state. The other marked "B" is formed by heating the "A" bloom to a red heat and again compressing it. This hot-pressing is not practiced by the Company in using blooms in their own open-hearth furnace, nor is it needed except to make them stand rough handling in transportation.

The specimen "No. 3" is the ingot obtained in the ordinary open-hearth process, merely substituting the sponge bloom for the wrought iron ordinarily used.

Estimates of the cost of production accompany the specimens. In these estimates the items peculiar to the process are given specifically, while the cost of material is left to be filled in by each member, to suit the condition of his own locality, so that he may compare the results of the direct process with those at present obtained.

Connected with this subject of cost I may state that we use an open-hearth furnace which works on the principle of "continuous regeneration," as it has been called, that is, the outgoing flames pass continuously in one direction and the ingoing air and gas also pass continuously in one direction, the waste heat being recovered by absorption through the walls of the channels which confine each current within its own bounds. We find, in practice, great satisfaction in the working of this furnace, the heat being an equable one, undisturbed by the reversing of the currents.

As to the character of the ingots pro-

duced, it is only necessary to say that they offer no peculiar feature. It is the experience of all connected with open-hearth practice, that good materials are necessary to give good results. The ore employed for making the sponge should be either free from phosphorus or the latter must exist as a combination with lime, only mixed mechanically with the iron-oxide. Sulphur must be eliminated before commencing the production. In speaking of the *absence* of sulphur and phosphorus, it is meant that they must not exceed the limits recognized in the Bessemer process. But if the ore is right, the iron-sponge will be a fitter material to melt in the cast iron than any other form of wrought iron, because it presents the iron as an elementary body, having no chemical affinity for the earthy constituents of the ore, and these latter pass off to the surface as soon as fusion takes place. The pig iron employed should be good enough for use in the Bessemer process, but need not be so high in carbon, and is all the better the less silicon it contains.

The ratio of carbon is of course under the same control as in all open-hearth practice, and the product may be either hard enough for high steel or soft enough to substitute for ordinary wrought iron.

The company claim that they realize, in actual working practice, the true "direct process," by first withdrawing the oxygen from the natural iron-oxide, and second, fusing the product with other iron containing carbon enough to facilitate this fusion.

As with other fusing products, the ingot can be made of a temper to suit all steel purposes, except tool-steel; or it can be cast as homogeneous metal, an article superior in quality to every other form of wrought iron.

## and Steel Association for 1874.

*Fourth Street, Philadelphia.*

### PRESIDENT.

SAMUEL J. REEVES,  
410 Walnut Street, Philadelphia.

### VICE PRESIDENTS.

S. M. FELTON,  
125 South Fifth Street, Philadelphia.  
JAMES I. BENNETT,  
Pittsburgh.  
JAMES PARK, JR., Pittsburgh.

### SECRETARY.

JAMES M. SWANK,  
265 South Fourth Street, Philadelphia.

### TREASURER.

CHARLES WHEELER,  
Philadelphia.

### EXECUTIVE COMMITTEE.

S. J. REEVES, 410 Walnut Street, Philadelphia.  
A. S. HEWITT, 17 Burling Slip, New York.  
C. S. KAUFFMAN, Columbia, Pennsylvania.  
J. B. MOORHEAD, 138 S. Third St., Philadelphia.  
JAMES PARK, JR., Pittsburgh, Pennsylvania.  
PERCIVAL ROBERTS, 265 S. Fourth St., Philada.  
JAMES I. BENNETT, Pittsburgh, Pennsylvania.

R. H. LAMBORN, 125 S. Fifth Street, Philadelphia.  
ALFRED HUNT, Bethlehem, Pennsylvania.  
E. Y. TOWNSEND, 218 S. Fourth St., Philadelphia.  
CHARLES WHEELER, Philadelphia.  
CHAS. STEWART WURTS, 218 S. Fourth St., Phila.  
A. B. STONE, Cleveland, Ohio.  
EDWARD HARRISON, St. Louis, Missouri.

### STANDING COMMITTEES.

(Also members *ex officio* of the Executive Committee.)

BAR IRON.—James O. Lewis, Pittsburgh, Pa.;  
Oliver Williams, Catasauqua, Pa.; N. Rowland,  
Philadelphia; Geo. L. Reis, New Castle, Pa., and  
Robert McCarthy, Syracuse, New York.

PLATE IRON.—James I. Bennett, Pittsburgh, Pa.;  
Dr. Charles Huston, Coatesville, Pa.; Chas. H. Ash-  
burner, Baltimore, Md.; Charles H. Bailey, Potts-  
town, Pa., and Wm. R. McIlvaine, Reading, Pa.

PIG IRON.—C. J. Nourse, Columbia, Pa.; J. H.  
Maxson, St. Louis, Mo.; A. B. Cornell, Albany,  
N. Y.; Henri N. Braem, Poughkeepsie, N. Y., and  
G. Fuller, Boonton, N. J.

RAILROAD IRON.—D. J. Morrell, Johnstown, Pa.;  
E. B. Ward, Detroit, Michigan; S. A. Fuller,  
Cleveland, Ohio; Chester Griswold, Troy, N. Y.,  
and W. E. O. Coxe, Reading, Pa.

### BOARD OF MANAGERS.

E. B. WARD, Detroit, Michigan.  
A. S. HEWITT, 17 Burling Slip, New York.  
SAMUEL THOMAS, Hokendauqua, Pennsylvania.  
JOHN H. REED, Boston, Massachusetts.  
JAMES PARK, JR., Pittsburgh, Pennsylvania.  
JOSEPH KINSEY, Cincinnati, Ohio.  
C. S. KAUFFMAN, Columbia, Pennsylvania.  
THOMAS S. BLAIR, Pittsburgh, Pennsylvania.  
A. B. STONE, Cleveland, Ohio.  
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